

The Stigma of Obesity: A Review and Update

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Obesity (2009) **17**, 941–964. doi:10.1038/oby.2008.636

Obese individuals are highly stigmatized and face multiple forms of prejudice and discrimination because of their weight (1,2). The prevalence of weight discrimination in the United States has increased by 66% over the past decade (3), and is comparable to rates of racial discrimination, especially among women (4). Weight bias translates into inequities in employment settings, health-care facilities, and educational institutions, often due to widespread negative stereotypes that overweight and obese persons are lazy, unmotivated, lacking in self-discipline, less competent, non-compliant, and sloppy (2,5–7). These stereotypes are prevalent and are rarely challenged in Western society, leaving overweight and obese persons vulnerable to social injustice, unfair treatment, and impaired quality of life as a result of substantial disadvantages and stigma.

In 2001, Puhl and Brownell published the first comprehensive review of several decades of research documenting bias and stigma toward overweight and obese persons (2). This review summarized weight stigma in domains of employment, health care, and education, demonstrating the vulnerability of obese persons to many forms of unfair treatment. Despite evidence of weight bias in important areas of living, the authors noted many gaps in research regarding the nature and extent of weight stigma in various settings, the lack of science on emotional and physical health consequences of weight bias, and the paucity of interventions to reduce negative stigma.

In recent years, attention to weight bias has increased, with a growing recognition

of the pervasiveness of weight bias and stigma, and its potential harmful consequences for obese persons. The aim of this article is to provide an update of scientific evidence on weight bias toward overweight and obese adults through a systematic review of published literature since the 2001 article by Puhl and Brownell. This review expands upon previous findings of weight bias in major domains of living, documents new areas where weight bias has been studied, and highlights ongoing research questions that need to be addressed to advance this field of study.

A systematic literature search of studies published between January 2000 and May 2008 was undertaken on computerized psychological, medical, social science, sport, and education databases including PsycINFO, PubMed, SCOPUS, ERIC, and *SPORTDiscus*. The following keyword combinations were used: weight, obese, obesity, overweight, BMI, fat, fatness, size, heavy, large, appearance, big, heavyweight, bias, biased, discrimination, discriminatory, discriminate, stigma, stigmatized, stigmatization, prejudice, prejudicial, stereotype(s), stereotypical, stereotyping, victimization, victimize(d), blame(d), blaming, shame(d), shaming, teasing, tease(d), unfair, bully, bullying, harassment, assumptions, attributions, education, health, health care, sales, employment, wages, promotion, adoption, jury, customer service, housing, media, television. Reference lists of retrieved articles and books were also reviewed, and manual searches were conducted in the databases and journals for authors who had published in this field. Most studies retrieved for this review

were published in the United States. Any articles published internationally are noted with their country of origin.

Research on weight stigma in adolescents and children was excluded from this review, as this literature was recently reviewed elsewhere (8). Unpublished manuscripts and dissertations were also excluded. In addition, issues pertaining to measurement of weight stigmatization, and demographic variables affecting vulnerability to weight bias such as gender, age, race, and body weight are not addressed in this review. This article instead primarily reviews the evidence of specific areas where weight bias occurs toward adults and its consequences for those affected.

This article is organized similarly to the first review published by Puhl and Brownell (2), with sections on weight bias in settings of employment, health care, and education. New sections have been added including weight bias in interpersonal relationships and the media, as well as psychological and physical health consequences of weight bias, and the status of stigma-reduction research. As with the 2001 article, this review also provides an update on legal initiatives to combat weight discrimination, and outlines specific questions for future research.

EMPLOYMENT SETTINGS

In their 2001 review, Puhl and Brownell summarized research documenting weight-based prejudice and discrimination in employment settings (2). At that time, emerging evidence demonstrated that overweight and obese workers face stereotypical attitudes from employers

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Received 28 August 2008; accepted 21 November 2008; published online 22 January 2009. doi:10.1038/oby.2008.636

and disadvantages in hiring, wages, promotions, and job termination because of their weight. Since then, there has been an increase in survey research, large population-based studies, and experimental work addressing weight discrimination in employment. Findings are summarized below.

Self-report studies indicate that perceptions of weight-based employment discrimination remain common among obese persons. In one survey study of overweight and obese women ($N = 2,249$), 25% of participants reported experiencing job discrimination because of their weight. In addition, 54% reported weight stigma from co-workers or colleagues and 43% reported experiencing weight stigma from their employers or supervisors (9). Examples of weight stigma in employment settings included being the target of derogatory humor and pejorative comments from co-workers and supervisors, and differential treatment because of weight such as not being hired, being denied promotions, or fired because of one's weight.

Several recent studies have examined weight discrimination in employment settings using data from the National Survey of Midlife Development in the United States, a nationally representative sample of adults ages 25–74 years. One study ($N = 2,838$) found that overweight respondents were 12 times more likely, obese respondents were 37 times more likely, and severely obese respondents were 100 times more likely than normal-weight respondents to report employment discrimination. In addition, women were 16 times more likely to report weight-related employment discrimination than men (10). Another study using the data of National Survey of Midlife Development in the United States ($N = 2,290$) found that among individuals who reported weight discrimination in employment almost 60% had experienced this mistreatment an average of four times during their lifetime. The specific types of employment discrimination reported included not being hired for a job, not receiving a promotion, and wrongful termination (4). Instances of wrongful termination that have been filed in legal cases typically

involve an obese employee who was fired because of his/her weight despite positive performance evaluations and/or despite weight being unrelated to job duties. To date, most studies reflect perceptions by employees that weight was the deciding factor for job termination. A third study analyzing data of National Survey of Midlife Development in the United States ($N = 3,437$) found that 26% of obese persons and 31% of very obese persons reported discrimination in the workplace, which they attributed to their weight and appearance. Furthermore, very obese persons working in professional jobs were more likely than obese nonprofessionals to report employment discrimination (11).

Several studies analyzing data from the National Longitudinal Survey of Youth suggest that obesity also negatively affects wages. In one study ($N = 12,686$), a consistent wage penalty for obese employees was demonstrated, even after controlling for socioeconomic and familial variables, and health limitations. For obese men, the wage penalty ranged from 0.7 to 3.4%. For obese women, the wage penalty was greater and ranged from 2.3 to 6.1% (12). The authors suggested that discrimination in training opportunities may explain some of the obesity wage penalty, although it should be noted that they did not test for employer-based discrimination. Another study using National Longitudinal Survey of Youth data ($N = 25,843$) found that for white females, an increase of 64 pounds above average weight was associated with a 9% decrease in wages, which was approximately equivalent to the difference of 1.5 years of education or 3 years of work experience (13). A third study analyzed data from the 1988 wave of the National Longitudinal Survey of Youth when respondents were 23–30 years old ($N = 6,601$). This analysis revealed that both black and white obese women experienced significant wage penalties, even after controlling for socioeconomic status and other related variables. Compared to their normal-weight counterparts, mildly obese and severely obese white women experienced a decrease in wages of 5.8% and 24%, respectively. Similarly, mildly obese and severely

obese black women's wages were 3.3% and 14.6% less than normal-weight black women's wages, respectively. Severely obese white men earned 19.6% less and severely obese black men earned 3.5% less than their normal-weight counterparts (14).

Other cross-sectional research supports these findings. In a study examining adults living in countries belonging to the European Union ($N = 17,767$ women and 34,679 men), it was observed that a 10% increase in the average BMI reduced the hourly wages of males by 1.9% and females by 3.3%. In Southern European countries, where citizens are reportedly more concerned with weight gain, the effect was much larger (15). Other work analyzing data from the 1984 National Lawyer Survey ($N = 722$) found that overweight male lawyers were paid less than normal-weight male lawyers (16).

Weight bias may also help explain studies documenting lower rates of employment for obese individuals. For example, Klarenbach and colleagues analyzed data from the Canadian Community Health Survey, a population-based household survey of over 73,500 individuals. The study found obesity to be associated with lower workforce participation, independent of associated comorbidities and sociodemographic factors (17). In addition, a study using data from a nationwide prospective cohort in the United States ($N = 4,290$) estimated the effect of obesity on future employment. After adjusting for sociodemographic characteristics, smoking status, exercise, and self-reported health, obesity was associated with reduced employment for both men and women (18). Other population-based studies from outside the United States support these findings (19–22).

Experimental research provides key evidence of causal links between weight-based discrimination and hiring decisions. Typically, experimental studies ask participants to evaluate a fictional applicant's qualifications for a job, where his or her weight has been manipulated (through written vignettes, videos, photographs or computer morphing). Roehling and colleagues recently conducted a meta-analysis of 32 experimental studies investigating

weight discrimination in employment settings (23). Studies were included in the analysis if they involved simulated employment decisions and demonstrated an effect size between target weight and job-related outcome variables. Outcome variables included hiring recommendations, qualification/suitability ratings, disciplinary decisions, salary assignments, placement decisions, and coworker ratings. Across studies, it was demonstrated that overweight job applicants and employees were evaluated more negatively and had more negative employment outcomes compared to nonoverweight applicants and employees.

The authors additionally assessed a number of moderators that may influence the relationship between weight and discriminatory attitudes. Potential moderators included both target and rater characteristics such as gender and race, and the type of job for which targets were evaluated. Although rater characteristics did not significantly influence the relationship between weight and employment ratings, several traits of the target emerged as important moderators. First, findings showed that both overweight men and women were equally susceptible to weight discrimination in the workplace, which challenges some previous research documenting gender differences in weight bias (4,24). The authors suggest that their finding should be interpreted with caution, as some research suggests that weight-based employment discrimination may occur at lower weight levels for women than for men (4,14,22), and the majority of the studies included in the meta-analysis contrasted a nonoverweight target with an obese target. If studies manipulated a wider range of weight levels and different forms of weight discrimination, greater differences may have been observed between men and women.

The meta-analysis also showed that overweight employees were more disadvantaged than nonoverweight applicants when they were being evaluated for jobs that required extensive public contact, and when they were rated for their desirability as a coworker. In addition, white targets were more heavily

penalized in employment decisions than overweight African Americans. However, these findings should also be interpreted cautiously because only two studies investigated the effect of race. Given that African Americans can be targets of racial bias, it may be difficult to disentangle the effects of weight bias among other layers of prejudice.

Finally, several methodological variables influenced results across studies. When participants were provided with a relatively large amount of job-relevant information prior to making their evaluations, the relationship between the target's weight and employment outcomes were weaker compared to studies where little job-relevant information was provided. The effects of weight discrimination were also stronger in studies that pilot-tested the weight manipulation information and in studies that presented the target's weight through written or verbal descriptions vs. videos or photographs (23).

These experimental findings clearly demonstrate that overweight and obese individuals are disadvantaged in workplace interactions, evaluations, and employment outcomes as a result of negative weight-based stereotypes. Research to date suggests that the most common stereotypes about obese employees include views that they are less conscientious, less agreeable, less emotionally stable, and less extraverted than their normal-weight counterparts (25–28). To investigate the validity of common stereotypes about overweight job applicants and employees, Roehling and colleagues conducted two studies to examine the relationship between body weight and four relevant personality traits (conscientiousness, agreeableness, emotional stability, and extraversion) (29). In the first study using a nationally representative sample of 3,176 adults, BMI was compared with personality trait measures from the Midlife Development Inventory Personality Scales. Findings showed that the relationship between personality and demographic variables (age or gender) was stronger than the relationship between BMI and personality traits. The second study compared body weight and personality traits from

the NEO Personality Inventory (Short Form) in 320 college students. No evidence was found for differences in personality characteristics based on weight. These findings help challenge commonly held stereotypes about negative personality traits of overweight employees.

Summary and methodological limitations

Recent survey and population-based studies show that high percentages of obese workers perceive consistent weight-based disparities in employment settings. Their perceptions are supported by large-scale studies documenting lower wages for obese employees, and experimental research demonstrating that overweight job applicants experience discrimination in hiring and employment decisions. Future work should examine a wider range of weight levels, job types, gender and race interactions with weight, and both subtle and overt forms of bias to help provide a clearer understanding of weight discrimination in the workplace. It will also be useful to assess potential mediators and contextual factors (e.g., employer concerns about rising health-care costs) that may influence employment outcomes for obese individuals.

HEALTH-CARE SETTINGS

Overweight and obese patients are vulnerable to multiple forms of weight bias in health-care settings. In 2001, Puhl and Brownell summarized a number of studies demonstrating that health-care professionals (e.g., physicians, nurses, psychologists, and medical students) possess negative attitudes toward obese patients, including beliefs that obese patients are lazy, noncompliant, undisciplined, and have low willpower (2). Research since 2001 expands upon this body of knowledge, providing new insight into providers' attitudes and weight management practices, and health-care experiences of obese patients.

HEALTH PROFESSIONALS' ATTITUDES TOWARD OBESE PATIENTS

In recent years, increasing research in the United States and abroad demonstrate

that health-care providers in a range of specialty areas endorse stereotypical assumptions about obese patients and attribute obesity to blameworthy causes.

Physicians. In a study of over 620 primary care physicians, >50% viewed obese patients as awkward, unattractive, ugly, and noncompliant. One-third of the sample further characterized obese patients as weak-willed, sloppy, and lazy. Physicians also viewed obesity as largely a behavioral problem caused by physical inactivity and overeating (30). A study of British health-care professionals ($N = 255$) found that providers perceived overweight people to have reduced self-esteem, sexual attractiveness, and health. Providers believed that physical inactivity, overeating, food addiction, and personality characteristics were the most important causes of overweight (31).

In a study of 600 general practitioners (GPs) in France, 30% considered overweight and obese patients to be lazier and more self-indulgent than normal-weight people, and 60% identified lack of patient motivation as the most common problem in treating overweight and obese patients. GPs also considered “eating too much” as the most important risk factor for obesity, ranked above genetic and environmental factors. Providers who endorsed negative attitudes toward obese patients were less likely to subscribe to medical journals, suggesting that GPs may not have been familiar with current research examining the complex causes of obesity (32). Another French study found that 73% of GPs ($N = 607$) agreed that health professionals hold negative attitudes toward their obese patients. GPs ranked patient noncompliance and lack of motivation as the most important problems they experienced in treating obesity (33).

A study of 752 Australian GPs found similar results, where providers reported that their most common frustrations in weight management were patients’ lack of compliance and motivation (34). Likewise, an Israeli study showed that 31% of family physicians ($N = 510$) agreed that overweight people tend to be lazier than normal-weight people and 25% agreed that overweight people lack

willpower and motivation compared to normal-weight people (35).

In a British qualitative study, primary care physicians ($N = 21$) reported beliefs that obesity was caused by an unhealthy diet and lack of exercise and that it was the responsibility of the patients themselves to manage their weight. Physicians expressed frustration that patients made excuses as to why they could not comply with lifestyle recommendations. Despite these frustrations, physicians expressed an interest in maintaining positive provider–patient relationships (36). In contrast, a study examining attitudes of military family physicians ($N = 214$) found that providers reported generally positive attitudes toward obese patients. However, 25% indicated that their obese patients were lacking in self-control (37).

Experimental work supports findings of self-report studies. Hebl and Xu examined how a patient’s body weight influences attitudes among primary care physicians ($N = 122$), who viewed one of six vignettes depicting patients who were identical except for sex (male/female) and BMI (23, 30, or 36 kg/m²). The results revealed a strong, consistent linear trend in the way that physicians responded to the size of patients. As the patient became heavier, physicians judged them to be less healthy, worse at taking care of themselves, and less self-disciplined. In addition, as patient BMI increased, physicians reported liking their jobs less, having less patience, and less desire to help the patient. Physicians also reported that seeing obese patients was a greater waste of their time and that heavier patients were more annoying than patients with lower body weights. Furthermore, physicians predicted that heavier patients would be less likely to comply with medical advice and would be less likely to benefit from counseling (38).

Since 2000, two studies have employed the Implicit Association Test to assess implicit antifat bias among health professionals who specialize in treating obesity. Both studies found there to be a strong implicit antifat bias among clinicians and researchers specializing in obesity. Teachman and Brownell found that health professionals ($N = 84$) associated “fat people” with negative attributes

such as “bad” and “lazy” and “thin people” with positive attributes, such as “good” and “motivated”. Participants also endorsed the explicit belief that thin people are more motivated than fat people (39). Schwartz and colleagues found that health professionals ($N = 389$) endorsed both the implicit and explicit stereotypes that fat people are lazy, stupid, and worthless (40).

Despite common beliefs that obese patients lack motivation to make lifestyle changes and are noncompliant with treatment recommendations (32,34,35,41) there is evidence to suggest that physicians’ perceptions of patient motivation may be misguided. Befort and colleagues found that patients’ self-reported level of motivation regarding weight management was significantly higher than physicians’ perceptions. A motivation level of “10 = completely motivated” was reported by 30% of female and 21% of male patients, whereas physicians rated only 2.5% and 3.1% of their female and male patients, respectively, as being a “10”. Similarly, some research suggests that physicians and patients have different perceptions about the causes of obesity, which may influence endorsement of weight stigma. In one United Kingdom study, GPs ($n = 89$) reported a victim-blaming approach toward obesity, deeming the individual responsible for both the cause (e.g., eating too much) and the solution to their weight problem. However, patients ($n = 599$) in the study were more likely to attribute obesity to medical causes or low income (42). Differences in perceived motivation or causes of obesity between doctor and patient may hinder positive communication regarding weight management or healthy lifestyle changes (43).

Nurses. Recent research has also demonstrated negative attitudes toward obese patients among nurses. A 2006 review of research focusing on nurses’ attitudes toward adult overweight and obese patients reported that nurses consistently express biased attitudes toward obese patients, reflecting common weight-based stereotypes that obese patients are lazy, lacking in self-control, and noncompliant

(41). In a British study of 398 nurses, nearly 69% agreed that personal choices about food and physical activity explain why a person becomes obese, one-third agreed that obesity is due to a lack of willpower concerning food, and only 8.2% agreed that obese people are motivated about lifestyle change (44). Nurses with lower BMIs expressed more negative perceptions of obesity.

Brown and Thompson conducted qualitative interviews of 15 primary care nurses in England concerning their attitudes and beliefs toward obesity management. Although nurses were aware that obesity is a stigmatized condition and were careful to avoid weight-based stereotypes, some expressed frustration with patients' noncompliance and wanting an "easy way out". Nurses with high BMIs felt self-conscious about their size and reported that patients made rude comments about their weight (45). Contrary to other studies assessing nurses' attitudes toward obese patients, a 2006 study found that registered nurses ($N = 119$) had positive attitudes toward adult obese patients and that nurses were concerned with providing respectful patient care. However, these findings should be interpreted with caution due to the study's low response rate (16.2%), which may indicate that only nurses who are sensitive to the needs of the obese patients chose to complete and return the survey (46).

Medical students. Medical students express many of the same negative attitudes toward obese patients as more seasoned health professionals. Wear and colleagues examined attitudes of medical students ($N = 54$) toward a variety of patients, and found that the students reported, with nearly total agreement, that severely obese patients were the most common target of derogatory humor by attending physicians, residents, and students, which occurred most often in surgery and obstetrics-gynecology settings (47). Students indicated that their denigration of obese patients was due to both the assumption that patients were to blame for their condition and because patients' obesity caused extra work for students. Students reported that

overweight and obese children were also targets of humor. Most of the students did not consider derogatory humor directed toward obese patients to be inappropriate. In another study, medical students ($N = 48$) were randomly assigned to view videotapes of actors pretending to be either average weight patients or obese patients (by using padding and bulky clothing) visiting their physician for the first time. Students who viewed tapes of the obese-appearing patients predicted that the patients would be less likely to make lifestyle changes, would not be as responsive to counseling, and would be less likely to comply with treatment recommendations, compared to students who viewed average weight patients. Patients who appeared obese were also rated by students as less attractive, less compliant, and more depressed than average weight patients (48). Similarly, dental students have reported negative attitudes toward obese patients. One study ($N = 420$) found that nearly one-third of dental students acknowledged having negative reactions toward the appearance of obese patients, 30% felt that obese people are lazier than nonobese people, 26% felt that obese people lacked willpower and motivation, 18% were uncomfortable examining an obese patient, and 17% considered it difficult to feel empathy for an obese patient (49).

Fitness professionals and dietitians. Fitness professionals and exercise science students also express weight bias. In a study of fitness professionals ($N = 325$), 62% agreed that obesity is a significant cause of personal rejection, and most participants believed that personal factors such as sedentary lifestyle, poor eating behaviors, and psychological problems were the most important causes of obesity (50). Using the Implicit Association Test, other research has documented a strong implicit antifat bias among exercise science students ($N = 246$). Being female, white, and having a lower BMI were all associated with stronger implicit antifat bias. Students also endorsed explicit attitudes that fat people are lazy, physically unattractive, buy too much junk food, and could lose weight if they really wanted to do so (51).

Recent work suggests that dietitians are not immune to weight bias. Berryman and colleagues assessed negative attitudes toward obesity among dietetics and nondietetics students (52). Both groups ($N = 76$) exhibited moderate levels of fat phobia as a whole and 16% of both groups exhibited high levels of fat phobia. The majority of students (ranging from 71 to 91%) agreed or strongly agreed with the stereotypes that overweight people overeat, are inactive, slow, insecure, shapeless, and have no endurance, low self-esteem, and poor self-control. Over half of students agreed or strongly agreed that overweight people are unattractive, have no willpower, and are lazy. The authors conclude that dietetics curriculum does not adequately dispel weight bias. A study of 187 British dietitians found that although attitudes were mixed, dietitians rated obese people less positively than overweight people and indicated that obese people were more responsible for their excess weight than overweight people (53). Another study found that Australian dietitians ($N = 400$) reported frustration with their overweight and obese clients' lack of commitment and motivation, poor compliance, and unrealistic expectations (54).

Most recently, Puhl and colleagues used an experimental design to assess weight bias among dietetics students (55). One hundred and eighty-two dietetic students were randomly assigned to read one of four patient health profiles that varied only by weight and gender. Compared to students who read non-obese patient profiles, students who read obese profiles rated the patients as less likely to comply with treatment recommendations and as having worse diet quality and health status, despite the fact that dietary and lifestyle information were identical across conditions. In contrast, obese and nonobese patients were rated to be similarly motivated. In addition, participants in all conditions expressed a moderate amount of fat phobia, similar to findings of Berryman *et al.* The majority of the dietetic students (ranging from 54 to 81%) agreed that obese individuals have poor self-control, lack endurance, and

suffer from low self-esteem. Students also believed that obese individuals tend to overeat, are unattractive, slow, insecure, and inactive.

Providers' weight management practices

In addition to negative provider attitudes toward obese patients, it is also important to examine whether physicians' weight management treatment practices may compromise care for obese patients. For example, recent research shows that primary care physicians ($N = 620$) felt ill-equipped to treat obesity and believe that treatment is futile. Less than half felt competent in prescribing weight loss programs and only 14% believed themselves to be successful in helping obese patients lose weight (30). Another study of 600 GPs in France found that 57% felt they were ineffective in managing patients' weight. Despite feeling unprepared to treat obesity, 60% of the GPs set stricter weight loss standards for their patients than recommended guidelines (32). Similarly, another study of French GPs ($N = 607$), reported that only 42% felt they were sufficiently prepared to treat heavy patients (33).

Befort and colleagues found that physicians ($N = 29$) reported that they discuss weight at approximately half of their appointments but would prefer to discuss weight at only one-quarter of their appointments (43). Another study of 510 family physicians found that 72% believed that they had limited efficacy in treating obesity and considered themselves poorly prepared by their medical training to treat overweight patients. In addition, 60% reported insufficient knowledge regarding nutritional issues (35). In an Australian study, GPs ($N = 752$) felt they were sufficiently prepared to treat patients who were overweight, but approximately half had low expectations for the effectiveness of weight management (34).

Other health professionals also report feeling professionally unprepared to treat obesity. A study of nurses ($N = 398$) found that only 21.6% agreed that they are effective in helping obese clients lose weight (44). Among a sample of 400 dietitians, less than half felt prepared to

treat clients who are obese and only one-third believed that dietitians are effective in the management of obesity (54). Block and colleagues found that internal medicine residents ($N = 87$) had a poor grasp of the tools necessary to identify and evaluate obesity. Fifty-six percent of residents did not feel qualified to treat obese patients and one-third believed that treating obesity was futile. Furthermore, residents who felt unqualified to treat obese patients were more likely to agree that behavioral factors were the primary cause of obesity (56).

Although one study has reported that fitness professionals generally consider counseling obese patients for weight loss to be professionally gratifying (50), most studies demonstrate that health professionals feel that treating obesity is professionally unrewarding (32–34,37,54). If providers are professionally unsatisfied treating obese patients, they may be deterred from putting forth sufficient effort to help their obese patients. For example, recent experimental research suggests that physicians may spend less time with overweight patients than non-overweight patients. Hebl and Xu demonstrated that physicians who viewed profiles of heavier patients indicated that they would spend less time with those patients than physicians who viewed profiles of thin patients. In addition, only 42% of physicians chose to discuss weight loss with obese patients (38).

These findings parallel other work showing that overweight male patients perceive their physicians spend significantly less time with them than the duration of time reported by nonoverweight male patients (57). Bertakis and Azari, using a prospective design, investigated the impact of obesity on primary care by analyzing videotapes of 506 first-time patient visits with 105 physicians (58). Physicians spent less time providing health education to obese patients, while spending more time providing health education to patients who had better physical health and higher economic status. Additionally, patients' obesity was unrelated to provider discussions regarding nutrition. Another study found that >50% of physicians indicated that they would spend more time with

obese patients if they were appropriately reimbursed (30). Taken together, these findings suggest that providers may be spending inadequate time with obese patients, despite the importance of providing them with information and resources to engage in healthy lifestyles.

Patients' views of biased treatment in health care

Providers' negative attitudes and questionable weight management practices do not go unnoticed by overweight and obese patients. Puhl and Brownell examined experiences of weight stigma among overweight and obese women ($n = 2,449$), and found that 53% reported receiving inappropriate comments from doctors about their weight. Furthermore, doctors were reported as the second most common source of stigma, among a list of over 20 possible sources. Sixty-nine percent of women reported experiencing stigma from a doctor once, and 52% on multiple occasions. Participants also reported experiencing stigma from other health professionals, including nurses (46%), dietitians (37%), and mental health professionals (21%). A smaller subsample matched for age and gender ($n = 222$) yielded similar results concerning stigmatizing experiences by health professionals (9).

In a study of 105 bariatric surgery candidates and 214 applicants to a pharmaceutical weight loss trial, 43% of surgery candidates and 21.6% of nonsurgery patients reported that they had been treated disrespectfully by medical professionals because of their weight. In addition, 43.4% of surgery candidates and 22.5% of nonsurgery candidates reported being very upset by comments that doctors have made about their weight. More than 70% of patients in both groups reported that they felt like most doctors do not understand how difficult it is to be overweight (59). Another study of 161 obese adults attending dietetic outpatient clinics in the United Kingdom found that the majority of respondents (84%) agreed that "weight is blamed for most medical problems." Those with a higher BMI were more likely to agree with the statements "chairs are never big enough" and

“I am regarded as a second class citizen”. Women were also more likely to agree with the statement “nobody looks into why I am overweight – they just put me on diets” (60).

Brown and colleagues conducted semi-structured interviews with 28 British obese patients about their experiences in primary care. Participants reported reluctance to address weight concerns with their health-care providers and perceived that they would not be taken seriously. Participants also discussed concerns about the stigmatized nature of obesity and expected to face negative stereotypes in primary care, however, mentioned the possibility of nurse-led support groups as an avenue for improving health-care services (61). Another study of 2,340 patients who completed self-report surveys showed that obese patients reported low levels of satisfaction with most aspects of medical care at their most recent visit compared to normal-weight patients. However, the association was attenuated after adjusting for health status. The authors suggest that the strong association between self-reported health status and patient satisfaction in the study may have masked a relationship between obesity and lower satisfaction (62).

Some studies suggest that obese patients report ambivalent or somewhat positive attitudes about their health-care experiences (57,63,64). One study of 9,914 adult patients who completed the 2000 Medical Expenditure Panel Survey and had visited a health-care professional in the past 12 months found there to be a very weak unadjusted association with BMI and patient satisfaction. However, after adjusting for demographic and health-care related variables, a small association was observed between BMI and patient satisfaction for those ≥ 55 years of age (65). More work is needed to clarify perceptions of care by obese patients, and to determine whether weight bias contributes to this relationship.

Impact of weight bias on health-care utilization

Obese patients who experience stigma in health-care settings may delay or forgo

essential preventive care. Several studies show that obese persons are less likely to undergo age-appropriate screenings for breast, cervical, and colorectal cancer (66–74). Furthermore, research shows that lower rates of preventive care exist independently of factors that are typically associated with reduced health-care use, such as less education, lower income, lack of health insurance, and greater illness burden (71,73). Studies that have attempted to assess the reasons why obese women delay or forgo these preventive services have found that women report weight-related barriers, and in some cases, weight bias. Amy and colleagues surveyed 498 overweight and obese women about their perceived barriers to routine gynecological cancer screenings. For women with a BMI >55 kg/m², 68% reported that they delayed seeking health care because of their weight, and 83% reported that their weight was a barrier to getting appropriate health care. When asked about specific reasons for delay of care, women reported disrespectful treatment and negative attitudes from providers, embarrassment about being weighed, receiving unsolicited advice to lose weight, and gowns, exam tables, and other equipment being too small to be functional. The percentage of women reporting these concerns increased as BMI increased (75).

Another study of 216 women also found that BMI is associated with an increase in the delay and avoidance of preventive care. Women gave reasons for avoiding health care, such as having gained weight since their last visit, not wanting to be weighed on the providers' scale, undressing in the exam room, and knowing they would be told to lose weight (76). Wee and colleagues also found that, severely obese white women ($N = 6,419$) were significantly less likely to undergo cervical cancer screening compared with normal-weight women, even after controlling for sociodemographic variables, health-care access, and illness burden. These women reported embarrassment or discomfort as the primary reason for not undergoing screening (71). These findings are concerning, especially given the

incidence of cancer and mortality rates in obese individuals (77). Removing the stigma-related barriers to receiving cancer screenings may help to diminish the relationship between excess body weight and cancer mortality. Alternatively, a small number of studies conducted outside of the United States find no association between BMI and use of preventive services (78,79). More research is needed to determine why these differences exist between countries.

Summary and methodological limitations

Building upon the evidence reviewed by Puhl and Brownell (2), recent studies confirm that obese patients encounter prejudice, ambivalence, and oftentimes unsatisfactory treatment in health care. Because much of the research continues to rely on self-report measures, there remains a need to examine actual health-care practices among providers, and records of patient data concerning their treatment outcomes and health-care utilization. Despite these gaps in research, it is clear that efforts to systematically improve the health-care experience for overweight and obese individuals are warranted. Specifically, research is needed to determine the most effective ways to educate providers' about weight bias in health care, dispel damaging obesity stereotypes, and to promote strategies to improve patient care. Some intervention strategies may be as straightforward as being mindful of language used when discussing weight with patients. For example, one study investigated the terms that obese patients prefer for describing their excess body weight and found that patients disliked certain descriptors, such as “obesity” and “fatness,” but felt more comfortable when providers simply referred to their “weight” (80). More research is needed to determine the most effective ways for providers to communicate with their patients about weight. The limited efficacy of conventional weight loss treatment options may lead to frustration among providers in their legitimate, yet unsuccessful, attempts to help patients achieve significant, sustainable weight loss. Provider frustrations can

Table 1 Summary of key findings and evidence to date

Summary of key findings in existing weight bias research	Strength of evidence		
	Limited ^a	Moderate ^b	Strong ^c
Employment settings			
Obese employees perceive weight-based disparities in employment			x
Obese employees experience a wage penalty (controlling for sociodemographic variables)			x
Obese applicants face weight bias in job evaluations and hiring decisions			x
Obese employees face disadvantaged employment outcomes due to weight bias		x	
Health-care settings			
Health-care professionals endorse stereotypes and negative attitudes about obese patients			x
Weight bias negatively affects providers' weight management practices	x		
Obese patients perceive biased treatment in health care		x	
Weight bias negatively impacts health-care utilization	x		
Educational settings			
Weight bias contributes to educational disparities for obese students	x		
Educators endorse negative weight-based stereotypes and antifat attitudes	x		
Obese students perceive weight bias from educators	x		
Interpersonal relationships			
Weight bias negatively impacts romantic relationships for obese adults	x		
Obese individuals perceive weight bias from family members and friends		x	
Family/friends report stereotypes and negative attitudes about obese persons	x		
Media			
Overweight/obese characters are stigmatized in television and film			x
Overweight/obese characters are stereotyped in children's media (TV, videos, cartoons)		x	
Weight bias exists in news media		x	
Media and television exposure is positively related to stigmatization of obese persons	x		
Psychological and physical health consequences			
Weight bias increases vulnerability to depression, low self-esteem, and poor body image		x	
Weight bias contributes to maladaptive eating behaviors among obese individuals			x
Weight bias contributes to less participation/avoidance of physical activity	x		
Weight bias negatively impacts cardiovascular health outcomes	x		
Stigma-reduction strategies			
Effective intervention strategies have been identified to reduce weight bias	x		

^aInitial evidence has been documented, but clear conclusions cannot yet be established. ^bThere is adequate evidence to suggest the phenomenon exists, but additional research is needed to strengthen current findings. ^cConsistent evidence across a number of studies. Findings are clearly established.

unintentionally translate into biased and negative interactions with patients. Thus, it may be useful to focus treatment goals on patients' behavioral and lifestyle changes (rather than emphasizing weight loss as the only measure of success), which may help temper provider frustrations and facilitate more collaborative and sensitive provider-patient interactions.

In addition, considering that providers' often report blameful explanations for the causes of obesity, one key educational component may be to increase

providers' awareness about the complex etiology of obesity and the difficulties involved in obtaining significant and sustainable weight loss. However, it is important to note that the causal relationship between providers' negative attitudes and their treatment practices remains unclear. It is possible that lack of professional training and effective strategies for weight management lead providers to become frustrated and in turn form negative attitudes about obese patients. Establishing the link between provider attitudes, patient perceptions

of stigma, and treatment outcomes is imperative. Additional research needs are outlined in **Table 1**.

Recognizing the problem of weight stigma in health-care settings, health professionals are increasingly articulating the need for increased sensitivity in the treatment of obese patients (81–84). These authors recommend that providers emphasize compassionate care with obese patients, regardless of whether patients lose weight. They suggest that providers avoid assumptions that a patient's obesity is to blame for all of

their health concerns and that they treat obese patients with the same respect and concern as any other patient suffering from a chronic disease (83,84). Health-care providers have the unique opportunity to improve the welfare of obese patients. It is important that this opportunity is not lost due to weight bias.

EDUCATIONAL SETTINGS

As of 2001, research evidence was beginning to demonstrate that overweight and obese students face weight-based stigmatization from teachers, peers, and even parents in educational settings (2). This area has received less research attention than weight bias in health care or employment settings, but recent studies are providing further documentation of educational disparities between obese and nonobese groups.

A 2006 study of over 700,000 Swedish men found that those who were obese at age 18 had a lower chance of attaining higher education than their normal-weight peers, even after adjustments for intelligence and parental socioeconomic position (85). In a study of 15,061 respondents to the 1996 Health Survey for England, obesity was associated with lower educational attainment in both men and women (86). Additionally, a 2007 study using data from the National Longitudinal Study of Adolescent Health ($N = 10,829$) reported that obesity undermined the educational attainment of female students. Obese women were half as likely to attend college than nonobese women (87). However, in schools where female obesity was more prevalent, obese students had the same chance of attending college as nonobese students. Therefore, when female obesity was not the norm in the educational setting, obese women experienced greater educational disadvantages. These findings are supported by another study demonstrating that the relationship between obesity and lower academic achievement was stronger in schools with a lower average body size among students (88). In contrast, some studies have found no educational differences between obese and nonobese groups (19,89).

There are several possible explanations for links observed between obesity

and lower educational attainment, one of which is weight bias. Research suggests that weight bias among educators may influence obese students' academic performance as early as elementary school (8). In their 2007 review, Puhl and Latner examine research demonstrating that teachers report stigmatizing attitudes toward obese students (8). If biased attitudes unintentionally result in differential treatment of obese students, their educational potential may be compromised. More recently, studies have demonstrated that physical educators also have negative perceptions of obese students. O'Brien and colleagues found strong implicit antifat attitudes among 180 students training to become physical educators in New Zealand compared to students in another field of study. Physical education (PE) students who had completed more years of study displayed higher levels of antifat attitudes than first-year PE students, suggesting PE curriculum may contribute the formation of biased attitudes. PE students also explicitly endorsed the belief that obese individuals lack willpower (90). Another study found that PE teachers ($n = 105$) expressed moderate antifat attitudes and reported lower expectations for obese students across a variety of performance areas. PE teachers also perceived overweight students to have poorer social, reasoning, physical, and cooperation skills compared to nonoverweight students (91).

Other research indicates that obese individuals report experiencing weight bias from educators. Puhl and Brownell found that 32% of overweight and obese women ($N = 2,449$) reported experiencing weight stigma from a teacher or a professor, and 21% had experienced it more than once or multiple times (9). Another study found that overweight middle school students reported occasionally receiving negative comments from teachers that led them to feel upset and avoid participating in PE class (92).

It is also possible that other social factors can help explain the relationship between obesity and educational attainment. One prospective study of 5,467 individuals in Scotland found that family and neighborhood factors explained

much of the association between lower educational attainment and BMI, which was independent of childhood intelligence (93). In another longitudinal study of 1,044 individuals in Sweden, lower educational attainment for men was explained partly by low parental support for education during adolescence. For women, this relationship was partially explained by not being popular in school (94). Other studies also find that obese students have poor relationships with peers at school due to weight stigma (8), which may interfere with their success in educational settings.

Summary and methodological limitations

Research continues to suggest that heavy students face significant obstacles to educational achievement throughout their educational careers. However, this area of research remains understudied, and additional work is needed to assess the nature and prevalence of weight bias among educators and its impact on the educational achievement of overweight and obese students. It is also important to determine the relative contribution of weight bias compared to other social and economic factors that can potentially explain the relationship between obesity and educational success.

INTERPERSONAL RELATIONSHIPS

In addition to increased vulnerability to weight bias in employment, medical, and educational settings, obese individuals may also face stigma in close interpersonal relationships. This topic has received little research attention in the past, but recent studies have increasingly documented weight bias from romantic partners, family members, and friends, especially toward obese women.

Weight stigma may have an especially negative impact on dating prospects for obese women. A recent experimental study asked college students ($N = 238$) to rate a personal advertisement of a female target seeking a dating partner (95). Descriptions of the target's body weight were manipulated where she was described as being either "fat," "overweight," "full-figured," "obese," "5'4" and 197 lbs," or a control condition with no

weight descriptor. Findings showed that large-size descriptors resulted in negative evaluations of the target by both women and men compared to the control condition. Specifically, negative weight descriptors (*obese*, *overweight*, and *fat*) primed more negative stereotypes about the target than did a more positive weight descriptor (*full-figured*) or an objective descriptor (*197 lbs*). These findings support previous research showing that fewer men responded to a personal advertisement in which a female target was identified as obese compared to an advertisement in which a woman disclosed having a history of drug problems (96).

Additional research suggests that obesity negatively affects dating relationships for women. Sheets and Ajmere surveyed 554 undergraduates, and found that overweight women were less likely to be dating than thinner peers, and that body weight was negatively correlated with relationship satisfaction. In addition, women who had been told to lose weight by their romantic partners reported lower relationship satisfaction. Overweight women appeared to be more disadvantaged as dating partners compared to men, whose weight played less of a role in dating relationships (97).

Few studies have examined the effect of obesity or weight stigma on sexual relationships. One study asked college students ($N = 449$) to rank order six pictures of hypothetical sexual partners, including an obese partner, a healthy partner, and partners with various disabilities (including a partner in a wheelchair, missing an arm, with a mental illness, or described as having a history of sexually transmitted diseases) (98). Both men and women ranked the obese person as the least desirable sexual partner compared to the others. However, men ranked the obese partner as significantly less preferable than women did, suggesting that weight stigma may be heightened for women in sexual relationships. These findings parallel other work demonstrating that obese women (but not men) are rated as being less sexually attractive, skilled, warm, and responsive, and less likely to experience sexual desire compared to normal-weight peers (99).

Obese individuals may also experience weight stigma from family members and friends. In a recent study, overweight and obese women ($N = 2,449$) were surveyed about the most common interpersonal sources of weight stigma in their lives (9). Participants were provided with a list of 22 different individuals and asked how often each individual had stigmatized them because of their weight. Family members were the most frequent source of weight stigma, reported by 72% of participants. When asked about experiences of weight stigmatization from specific family members, participants reported being stigmatized about their weight by mothers (53%), fathers (44%), sisters (37%), brothers (36%), sons (20%), and daughters (18%). Participants commonly reported being the target of weight-based teasing, name calling, and inappropriate, pejorative comments from parents and siblings (100). Friends were also common sources of weight bias (reported by 60% of participants) as were spouses (reported by 47% of participants) (9). Qualitative research similarly shows that obese individuals report stigmatizing experiences from their family members and peers (101). These findings may help to explain previous research demonstrating that obese women are more dissatisfied with family relationships and partner relationships than thinner women (102) and have fewer close friends than thinner women (103).

Other recent research has documented mixed findings. Using a nationally representative sample of American adults ($N = 3,656$), Carr and Friedman found no differences across BMI categories with respect to self-reported quality of relationships with friends, co-workers, and spouses (104). However, severely obese individuals reported higher levels of relationship strain and lower levels of support from family members compared to thinner peers. Interestingly, this finding only remained significant for persons who were also overweight in adolescence, where it was found that emotional support from family members declined as BMI increased over time. For people whose body weight was in the

“normal” range by age 21, there was no association between BMI and relationship quality with family members.

Similarly, some research from Australia has reported a positive association between BMI and loneliness, even after controlling for age, gender, annual income, employment, and marital status (105), whereas another study reported no differences in degree of loneliness or romantic relationships between obese and nonobese persons in a Finnish sample (103). In addition, one study from Germany and another conducted in the United States have demonstrated that obese and nonobese persons fare similarly in self-reported social skills, social support, and subjective well-being (106), and size of social networks and socially based self-esteem (107). Thus, more work is needed to clarify whether, and to what extent, differences exist in interpersonal relationships, and how weight stigma contributes to these outcomes.

Summary and methodological limitations

Taken together, obese individuals (particularly women) appear to confront weight bias and negative stereotypes in a range of interpersonal relationships. However, given that several studies suggest that obese and nonobese persons fare similarly for quality of relationships, additional work in this area is needed to help clarify the differences that exist between obese and nonobese individuals, and how weight bias and gender influence these outcomes. Additional research is needed to determine the nature and extent of weight bias in social relationships, and to better understand how weight bias mediates the relationship between obesity and dissatisfaction in interpersonal relationships. It will also be important for research to address how these variables impact emotional well being of obese persons.

WEIGHT BIAS IN THE MEDIA

The media is a striking illustration of the social acceptability of weight stigma. Whether it be situation comedies, cartoons, movies, advertisements, or news reports, the media is unkind to overweight people. In the past year alone,

widely held news reports have held obese people partially responsible for rising fuel prices (108), global warming (109), and causing weight gain in their friends (110). Furthermore, overweight people remain one of the last acceptable targets of humor and ridicule in North American television and film.

Entertainment media

In adult and children's entertainment alike, thin characters are ascribed desirable attributes and dominate central roles. In contrast, overweight characters are rarely seen, unless in minor, stereotypical roles. Compared to thin characters on television, heavier characters are rarely portrayed in romantic relationships, are more likely to be the objects of humor and ridicule, and often engage in stereotypical eating behaviors (111,112). Fouts and Burggraf conducted a content analysis of 18 prime-time television sitcoms with 37 central female characters and found that the heavier the female character, the more negative comments she received from male characters. Moreover, negative comments directed toward heavy females were typically reinforced by audience laughter (113). This supports previous research demonstrating that underweight female characters receive significantly more positive verbal comments regarding their bodies than heavier characters (114). Interestingly, a content analysis of 75 central male characters on television found that the heavier the male character, the more negative self-references he made about his own weight. These comments were also typically followed by audience laughter (115).

Himes and Thompson recently examined 135 scenes from movies and television shows, finding that weight stigmatization and humor were often verbal and direct. Males and females were almost equally as likely to be targets of weight stigma; however, male characters were three times more likely to engage in fat stigmatization and humor than female characters. The authors note that the immense popularity of the movies and shows containing portrayals of weight stigmatization indicates its social acceptability (116).

Content analyses of children's media have also found that the prevailing tendency is to present positive messages about being thin and negative messages about being overweight. Klein and Shiffman examined 1,221 cartoons and over 4,000 cartoon characters that were produced between 1930 and the mid-1990s. Results showed that the proportion of overweight characters had declined in recent decades, while the prevalence of underweight characters had increased. In addition, socially desirable traits were associated with thinness and socially disapproved traits were associated with being overweight. Specifically, overweight characters were far more likely to be depicted as unattractive, unintelligent, and unhappy than their normal-weight or underweight counterparts. Overweight characters were also more often shown eating junk food and engaging in physical aggression, and half as likely to be classified as a "good guy" compared to thinner characters (117,118).

Similarly, a content analysis of 25 popular children's videos and 20 top children's books (for ages 4–8) found that thin female characters were depicted as having desirable traits such as sociability, kindness, happiness, and success. In contrast, overweight characters were commonly depicted as evil, unattractive, unfriendly, and cruel. Overweight characters were never shown in romantic relationships with thin characters, were often disliked by others, and often shown thinking about or eating food (119). Another recent content analysis of 19 children's television sitcoms and 162 characters from The Disney Channel, Nickelodeon, and Discovery Kids found that overweight characters were more likely to be portrayed as unattractive and having no friends compared to average weight and underweight characters (120).

A consistent finding in this area of research is that, compared to the general population, overweight characters are significantly underrepresented in the media, while underweight characters are overrepresented (112,115,117,120). This is especially true for female characters, who are more likely to be underweight

than male characters (111,113,114). These inaccurate representations present a distorted and unrealistic view of adults' and children's bodies, and may reinforce weight bias. Research demonstrates that media consumption among children is associated with negative weight-related attitudes. One study surveyed 303 first- to third-grade children and found that young boys learned from the media to denigrate fatness and idealize thinness (121). Television viewing predicted and increased the tendency of males to stereotype an overweight female target by associating the target with negative characteristics, such as greediness. Boys were also more likely to associate thin girls with characteristics such as "nice," "smart," "clean," "tells the truth," and "has lots of friends". Similarly, Latner and colleagues examined attitudes in New Zealand adolescents ($N = 261$) and found that media exposure (including videogame playing, television viewing, and magazine use) was significantly associated with stigmatizing attitudes toward obese youth (122).

Advertising

Another source of weight bias stems from the ubiquitous advertising of weight loss products and programs. Many advertisements emphasize the message that weight is easily modifiable and that successful weight loss is a simple matter of personal effort. Belief in the controllability of weight often predicts stigmatizing attitudes (123,124). One study found that weight loss infomercials portrayed overweight women as unhappy and unattractive and perpetuated the message that weight loss is simple and straightforward. Infomercials also used "before and after" images to convey the message that weight loss is achievable and will make a person happier (125). Geier and colleagues examined the stigma-producing effects of "before and after" diet advertisements (126). Fifty-nine participants either viewed "before and after" images, only "before" images, or only "after" images. Participants who viewed the "before and after" pictures endorsed more negative attitudes toward obese persons than those who viewed only the "after" pictures. In addition, people who

viewed both the “before” and “after” pictures indicated that weight is more easily controllable than those who viewed only the “before” or only the “after” picture.

News media

The framing of obesity in the news media is integral to the public’s understanding of obesity. Research shows that the news media often frames obesity in terms of personal responsibility (127–129), focusing on individual causes of obesity (e.g., eating an unhealthy diet) and individual-level solutions (e.g., changing one’s diet). This focus on personal responsibility eclipses other important dimensions of the obesity epidemic and often unfairly blames obese individuals, potentially reinforcing weight bias.

News coverage of obesity has increased dramatically in recent years (130), and studies show that coverage of the personal causes and solutions to obesity significantly outnumber other societal attributions of responsibility (128). Through an analysis of 751 articles on obesity published in *The New York Times* between 1990 and 2001, Boero demonstrated that obesity was presented as a moral panic through which blame is placed on individuals. Furthermore, discussions of obesity were influenced by pre-existing cultural and moral understandings about fatness, which tend to focus on individual willpower (131).

Sandberg analyzed 1,925 articles from Swedish daily newspapers from 1997 to 2001 and found that obese people were often stigmatized. Overweight people were presented as “stupid,” “ugly,” “naïve,” “irresponsible,” “lazy,” “greedy,” “without manners,” and “repugnant”. Within discussions of health-care resources, overweight people were compared to parasites. Weight was also presented as a female problem and overweight women were described as “too big and sloppy,” “sweating,” and “disgusting” (132). Furthermore, news items that presented weight loss “success stories” also contributed to victim-blaming and the stigmatization of overweight individuals. People who lost weight described their “before” selves as weak and uncontrolled.

Although news reports discussing other dimensions of obesity

(e.g., environmental, cultural, or biological explanations) are beginning to increase, personal responsibility arguments continue to be strongly expressed (129). It is interesting to note that references to personal solutions for obesity continue to outnumber references to personal causes (128). Thus, despite a broader understanding of the causes of obesity, solutions remain within the individual (131). Rich and Evans argue that unlike other public health issues (e.g., AIDS and cancer), the media seldom discusses the implications of its perspective on those affected by obesity, which may be damaging to individuals’ health by invoking feelings of shame, guilt, and inadequacy. However, to the extent that the media serves to alienate those who are overweight, the consequences of weight prejudice are deemed to have no bearing on the issue of obesity (133).

Summary and methodological limitations

A recent article in *Newsweek* titled “*The Obese Should Have to Pay More For Airline Tickets*,” referred to instituting weight surcharges for airplane tickets as an added “social disincentive to obesity” and further eluded to “drilling fat people for fuel” (134). Unfortunately, such offensive rhetoric is not unusual in media portrayals of obesity, which help shape social norms and negative attitudes about weight (122). Given the mass consumption of media in our culture, it is not surprising that stigmatizing attitudes toward overweight people are so common in our society.

In addition to the evidence presented above, there are other media outlets that undoubtedly influence how the public views obese individuals. For example, some studies suggest that weight-related content in magazines fuels both society’s drive for thinness and aversion to excess weight (135,136). Others have discussed the implications of weight loss reality television programs for falsely reinforcing notions of the controllability of weight (137,138). Interestingly, for nearly two-thirds of the American population, the only format on television where they will see people who have similar bodies to themselves is on shows where the entire

cast is trying desperately to become thin. Recent weight loss reality television programs have also been directed toward children. Studies that assess how these shows impact viewer’s psychological and physical health are needed. Other forms of media, such as video games, the Internet, and public health campaigns have yet to be studied to determine the nature of their stigmatizing content. Future research should analyze weight stigmatization in this broader context of the media. It will be important to identify the effect of weight bias in the media on public attitudes and behaviors, and to determine effective strategies to reduce stigmatizing content in the media.

UNDERSTUDIED DOMAINS OF WEIGHT BIAS

In 2001, Puhl and Brownell noted several understudied domains in which obese persons may be vulnerable to weight discrimination, including public accommodations, jury selection, housing, and adoption (2). These topics had emerged primarily in the media or in legal cases on public record, but no research had tested these issues. In the years since that time, the absence of science on these topics has remained unchanged. However, there has been increasing media attention to weight bias in new domains, such as proposed airline policies to charge obese travelers additional fees because of their excess weight (139,140) or for extra seats (141–143), and to terminate overweight flight attendants because of their weight (144). In addition, several companies have announced plans to impose financial penalties for obese employees if they are unable to meet predetermined BMI standards (145). There have also been cases highlighted in the media of obese patrons being the target of weight bias in restaurants (146), public health clubs (147), and cases of qualified obese adults being denied rights to adopt a child (148) or parents who have lost custody of their obese child (149). Still, no studies on these topics have been published, and the nature and extent of weight bias in these settings remains unknown. Given that these issues have received increasing media coverage, and in some cases national and international press attention

(140,142,144–146), it seems warranted to pursue scientific studies to document and clarify experiences of weight bias in these domains of daily living.

One recent study examined weight discrimination in customer service interactions, a topic that has not been previously studied. In two experiments, King and colleagues found that confederate obese shoppers faced more interpersonal discrimination from sales personnel in retail stores than nonoverweight confederate shoppers (24). In addition, when confederates wore casual attire, levels of interpersonal discrimination increased toward obese shoppers compared to when they wore professional attire. In a second experiment, interpersonal discrimination was greater toward obese confederates who were drinking a high-calorie beverage compared to obese confederates who provided evidence that they were trying to control their weight (by consuming a diet drink). In a third study, actual customers in a shopping area ($N = 191$) were surveyed about their shopping experiences, and obese customers reported higher levels of interpersonal discrimination than nonoverweight customers. Reports of greater interpersonal discrimination were associated with less time and money spent in the store than initially intended, and a lower likelihood of returning to the store in the future.

These findings suggest that subtle and covert forms of interpersonal discrimination may be common experiences for obese persons in typical activities of daily living. More work is needed to examine weight bias in customer service interactions, in addition to public accommodations and other domains mentioned above where obese persons may be disadvantaged. Addressing these understudied areas of weight bias will be important to obtain a comprehensive understanding of the multifaceted experiences of overt and covert forms of discrimination faced by obese persons.

PSYCHOLOGICAL AND PHYSICAL HEALTH CONSEQUENCES OF WEIGHT BIAS

Given the accumulation of literature documenting weight bias in multiple domains of living, it is critical to

determine its impact on emotional and physical health outcomes for overweight and obese individuals. There has been increasing research attention to the consequences of weight bias in recent years, with studies beginning to examine the moderating role of stigmatizing experiences on psychological functioning and health behaviors. Although this science is still in its infancy, recent studies suggest that weight bias may contribute to psychological distress and unhealthy behaviors. The findings in this area summarized below.

Psychological consequences

Depression. Risk factors that increase vulnerability to depression among obese individuals have not yet been clearly established. However, it has been suggested that weight stigmatization may be one of these factors (150), and that weight-based teasing may be a plausible mediator in the relationship between obesity and depression (151). Emerging evidence supports this suggestion in both clinical and nonclinical samples of obese persons. Friedman *et al.* found that frequency of weight stigma experiences was positively associated with depression in a sample of 93 treatment-seeking obese adults, even after controlling for the effects of age, gender, age of obesity onset, and BMI (152). Retrospective research has demonstrated that a history of appearance-based teasing in childhood was associated with depression among adult women with binge-eating disorder (BED) (153,154), and among patients with bulimia nervosa (154).

Studies of obese patients seeking weight loss surgery demonstrate similar findings. Chen and colleagues assessed the degree to which elevated depressed mood was associated with weight-based stigma among surgery seeking obese patients ($N = 60$), and found that experiences of weight stigma contributed unique variance to depressed mood above and beyond BMI, gender, age of onset of obesity, physical disability, and binge-eating status (155). Experiences of weight stigma independently contributed 32.6% of the variance in depression scores. Another study examined the relationship between childhood

weight-based teasing and psychological functioning in 174 bariatric surgery candidates, demonstrating that teasing history was associated with higher levels of depression, even after controlling for childhood onset of obesity (156). These findings suggest that it is not just the history of being overweight in childhood that is important, but that weight-based teasing may play a key role in vulnerability to depression.

In addition to these studies of weight-based teasing, recent research assessing specific weight-based stigmatization experiences (using the *Stigmatizing Situations Inventory*, (157)) show similar results in weight loss surgery samples. In one study of obese surgery candidates ($N = 94$), many reported weight-based stigmatization within the past month, with the most common experiences being environmental barriers (e.g., chairs that were too small, or not being able to find medical equipment in an appropriate size) and interpersonal attacks, which were positively correlated with depression (158). In another study (using the same assessment measure), stigmatization reported among bariatric surgery candidates ($N = 117$) was associated with greater symptoms of depression, even though the most common forms of weight-based stigma were reported to occur less frequently (159).

Among community-based samples, similar findings have emerged. Annis and colleagues demonstrated that overweight women ($N = 58$) with more frequent experiences of weight stigmatization in childhood, adolescence, and adulthood were more likely to report depressive symptoms (160). Carr *et al.* examined the relationship between obesity and emotional well-being in a nationally representative sample of 3,353 American adults (161). More than 40% of obese individuals with a BMI of ≥ 40 kg/m² reported being mistreated due to their weight, and this was significantly associated with impaired mood. Regression analyses demonstrated that obesity itself was not distressing, and that obese persons reported better emotional health than thinner peers after controlling for a number of obesity-related stressors. Thus, these findings suggest

that excessive weight by itself is not necessarily distressing, but that interpersonal mistreatment due to weight may lead to negative affect.

Finally, a recent study examined the relationship between perceived weight discrimination and psychiatric disorders in sample of obese persons ($N = 9,327$) from the National Epidemiologic Survey on Alcohol and Related Conditions (a nationally representative study of US adults) (M.L. Hatzenbuehler, K.M. Keyes, D.S. Hasin, personal communication). Perceived weight discrimination was significantly associated with a current diagnosis of mood and anxiety disorders, controlling for sociodemographic characteristics and perceived stress. In addition, weight discrimination was associated with an increased likelihood of mental health services use. Unfortunately, social support did not protect individuals from the negative psychological consequences of perceived weight bias.

Self-esteem. Weight bias may also mediate the relationship between obesity and self-esteem. Annis and colleagues examined self-esteem and stigma among three nonclinical groups of women ($N = 165$) (160). Equivalent degrees of stigmatization were reported by women who were currently and formerly overweight, and more frequent stigmatization throughout their lifetime was correlated with lower self-esteem. In a nationally representative sample of over 3,000 adults, Carr and Friedman found that obese individuals reported lower levels of self-acceptance than normal-weight persons, which was fully mediated by perceptions of weight discrimination (11).

Studies examining obese treatment samples have demonstrated that a history of appearance-based teasing is related to lower self-esteem (153), and that greater frequency of stigmatization experiences predicts low self-esteem even after controlling for differences in psychological functioning due to age, gender, age of obesity onset, and BMI (152). Similar findings have been documented for bariatric patients, where teasing history was associated with lower levels of self-esteem, after controlling for age of obesity onset (156), and among bulimia

nervosa patients (154). However, the authors note that different associations may emerge between teasing and psychological functioning (e.g., self-esteem) depending on the type of eating disorder symptoms present.

Interestingly, low self-esteem may also be present among those who express negative attitudes toward obese individuals. In a study of undergraduates ($N = 107$), self-esteem was correlated negatively with antifat attitudes and negative stereotypes toward obese individuals (162). This relationship was mediated by internal attributions about the causes of obesity. In addition, the authors found that the relationship between self-esteem and beliefs that weight is within person control was mediated by the extent to which the thin ideal was internalized by participants. More work is needed to clarify this relationship, and to determine how experiences of stigma, internalization of bias, and expressions of negative attitudes are each related to self-esteem.

Body image dissatisfaction. Weight bias may play an important role in fostering poor body image among obese individuals. Several studies have documented significant, positive associations between experiences of weight stigma and body dissatisfaction, among both nonclinical samples (160,163) and clinical samples of obese persons (152,153,164), and even after controlling for a range of variables such as BMI, gender, age, obesity onset (152,156). Other research indicates that weight-based teasing in adulthood may be particularly relevant in predicting body dissatisfaction compared to weight-based teasing in childhood, which has not been found to be associated with body image among clinical samples of obese women (164–166).

Some research suggests that weight stigma may have different implications for body image among women and men. Grilo and Masheb examined predictors of body dissatisfaction in a sample of 343 patients (78% females) with BED (167). Despite there being no gender differences for age of onset of overweight, teasing experiences, self-esteem or depression, findings indicated that childhood teasing about weight was a significant predictor

of body dissatisfaction for women, but not for men.

Recent research has begun to examine the relationship between weight bias and body dissatisfaction among different cultural groups of women, which may be especially important given that levels of body acceptance and body satisfaction may differ among certain ethnic groups (168). Shroff and Thompson examined this issue in female undergraduates from India ($N = 93$), and found that a history of weight-based teasing mediated the effect of BMI on body dissatisfaction (169). Reddy and Crowther similarly found that weight/shape teasing was significantly related to body dissatisfaction and maladaptive eating attitudes among 74 South Asian American women (170). Body dissatisfaction mediated the relationship between weight/shape teasing and maladaptive eating attitudes. These findings suggest that Indian- and South Asian-American women, like European-American women, experience negative consequences of weight-based teasing.

As with recent findings on self-esteem, some research also suggests that expressing weight bias may be related to body image dissatisfaction. In a sample of 264 young women (94 European Americans and 170 Latinas), those with high levels of body dissatisfaction and eating concerns reported higher levels of prejudice toward overweight and obese persons (171). However, whereas higher levels of body dissatisfaction were associated with worse antifat attitudes among Latinas who preferred English, this was not the case for Latinas who preferred Spanish, where higher body dissatisfaction was related to lower antifat attitudes. This suggests that level of acculturation (as indicated by language-use) could act as a protective factor for antifat attitudes. Additional research is needed to identify the impact of weight bias on body image for adults of different ethnic backgrounds, and to examine weight bias and body image in men.

Coping strategies and psychological well-being. It is important to consider the kinds of coping strategies that people use in response to weight bias, which may have important implications for the emotional

impact of stigma (5). One study of overweight and obese adults ($N = 2,449$) found that frequency of weight stigmatization was unrelated to psychological functioning (9), but showed that coping strategies used to deal with stigmatizing situations were related to psychological well-being and distress. For example, women who used positive coping strategies to deal with bias (e.g., positive self-talk and obtaining social support) reported healthier psychological adjustment, whereas negative coping responses were associated with higher distress. In addition, coping strategies emerged as the only significant predictor of self-esteem, even after controlling for current and previous weight, age, and beliefs about obesity. For men, coping with weight bias through self-acceptance was associated with higher self-esteem, and coping with avoidance, negative self-talk, and crying were related to lower self-esteem. At the same time, certain coping strategies which appeared to be adaptive, such as positive self-talk and using religion or prayer, were related to higher depressive symptoms among men, and strategies such as crying and ignoring the situation, were related to lower levels of depression. Although these findings seem counter-intuitive, they are similar to previous work (157) showing that some “positive” coping strategies were not clearly related to positive mental health.

Thus, it is plausible that coping strategies used to deal with stigmatizing experiences contribute as strongly to psychological well-being as the stigmatizing situation itself. These findings highlight the need for further study to determine what factors constitute “effective” coping methods with weight bias in various stigmatizing encounters, and whether positive vs. negative coping responses impact emotional adjustment differently across gender.

Summary and methodological limitations

Weight bias has concerning implications for psychological well-being of obese individuals, and may increase vulnerability to depression, low self-esteem, poor body image, and other psychiatric disorders. Strategies used to cope with

weight bias may also affect emotional outcomes, although it is not yet clear how different forms of coping influence levels of distress.

This relatively new area of research raises many important research questions regarding the impact of weight bias on emotional health. Longitudinal studies are needed to determine whether, and to what degree, experiences of weight stigma are responsible for increases in psychological symptoms, and to examine the effects of childhood weight-based teasing over time. It will also be important to examine whether experiences of weight stigma lead individuals to seek weight-loss surgery, and how various coping strategies can alleviate or increase the negative consequences of stigma. Most studies to date have used cross-sectional designs with primarily white female participants. Thus, research with more diverse samples can begin to identify the links between weight bias and psychological outcomes for individuals of different ages, sex, and ethnic backgrounds.

Physical health consequences

Another important avenue of research is to determine whether, and to what extent, weight bias affects physical health outcomes. Relatively few studies have examined these questions, but emerging research over the past several years suggests that weight bias may increase vulnerability to maladaptive eating behaviors and avoidance of physical activity, both of which may ultimately reinforce additional weight gain and obesity. This new area of research is summarized below.

Eating behaviors. Several studies have examined the relationship between experiences of weight bias and binge-eating behaviors. One study of 1,013 adult women (who were members of a weight loss support organization) found that those who internalized negative weight-based stereotypes reported more frequent binge-eating and refusal to diet as responses to weight bias compared to individuals who did not internalize stereotypes (172). Stigma experiences and internalization of weight-based

stereotypes did not predict engagement in weight loss strategies in this sample. Jackson and colleagues found that women with BED ($N = 115$) who reported a higher frequency of general appearance-based teasing experienced more frequent binge-eating and eating restraint (153). Among women who were obese, general appearance-based teasing was also positively associated with binge-frequency. Another study showed that recent experiences of weight-based stigmatization were associated with a diagnosis of BED in a sample of obese adults ($N = 94$) seeking weight loss surgery (158). Similarly, other recent work demonstrated that stigmatizing experiences significantly predicted binge-eating behavior among treatment-seeking obese adults ($N = 93$), accounting for 20% of the variance in binge-eating (173). However, findings also suggested that psychological distress may be an important mediator, as the association between stigmatizing experiences and binge-eating was reduced when the effects of psychological variables were controlled. Thus, it may be that experiences of stigma increase vulnerability to poor psychological functioning which in turn increases risk of binge-eating behaviors.

Among nonclinical samples, similar findings have emerged. Annis and colleagues observed a positive association between frequency of weight stigmatization and binge-eating behaviors among overweight women (160). Womble *et al.* tested a psychosocial model of binge-eating symptoms among 808 young adults (55% women), and found that the best fitting model for binge-eating involved an interaction of variables including weight-based teasing, weight cycling, body dissatisfaction, negative affect, and dietary restraint, which accounted for ~70% of the variance in both women and men (174). Weight bias may be associated with other types of maladaptive eating. A recent study of 203 undergraduates (64% females) found that weight-based teasing was related to eating disorder symptoms, and was more strongly related to dysfunctional eating cognitions than depressive cognitions (175). Teasing about weight has also been documented as a contributor

in emergent bulimic symptoms among Spanish females ($N = 153$) (176).

Other research with clinical samples has reported mixed findings, suggesting a more complex relationship between weight bias and eating behaviors. Rosenberger and colleagues examined correlates of childhood weight-based teasing in 174 bariatric surgery candidates, and found no differences in the frequency of binge-eating or dietary restraint among patients who reported a history of weight-based teasing in childhood vs. those who were not teased (156). Jackson and colleagues assessed the association between eating disorder symptoms and a history of being teased about weight or appearance in a sample of 32 female patients with bulimia nervosa and 32 patients with BED (matched for BMI and age) (154). Patients with bulimia nervosa reported a higher frequency of weight-based teasing than patients with BED, but both groups had similar levels of general appearance-based teasing. However, teasing was unrelated to most eating disorder features in both groups (with the exception of dietary restraint, which was associated with general appearance-based teasing in BED patients only).

Only one study has begun to examine the relationship between stigmatization and weight loss outcomes (177). Participants were 185 adults in the Trevoe Behavior Modification Program; an obesity treatment model that includes the unusual strategy of requiring members to lose a prescribed minimum amount of weight each month (or to maintain weight loss after reaching their goal weight), and members who do not meet these standards are subject to dismissal from the program. Findings showed that higher initial BMI, more stigmatizing experiences, lower body dissatisfaction, and greater fear of fat were associated with greater weight loss in this sample. Surprisingly, despite negative psychological correlates of stigmatization documented among participants, more frequent stigmatizing experiences also predicted greater weight loss. The authors caution generalizability of these results due to several factors, including the atypical sample of

participants who were willing to tolerate the consequences imposed by the program rules, and that at the time of assessment participants had been enrolled in the program for 2 months and had already lost weight (31% of participants had reached 90% of their weight loss goal). Due to the concurrent assessment of variables, the direction of causality is also uncertain from these findings, and additional research is clearly needed to assess how stigma impacts long-term weight loss.

Finally, coping responses used in reaction to weight bias may also have implications for eating behaviors. In a study of 2,449 overweight and obese women, 79% of participants reported coping with weight bias on multiple occasions by eating more food, 75% reported coping by refusing to diet, and 63% reported coping through attempts at dietary restraint (9). Thus, reactions to weight bias, in addition to the stigmatization itself, may influence eating patterns. It will be important for additional studies to clarify these relationships.

Physical activity. Several studies have begun to document reduced participation in (and avoidance of) physical activities among youths who experience weight bias (92,178,179), but to our knowledge, only one published study has examined this relationship among adults. Vartanian and Shaprow examined the relationship between experiences of self-reported weight stigma, exercise motivation and exercise behaviors among 100 female college students (164). Stigma experiences were positively correlated with motivation to avoid exercise, even after controlling for BMI and body dissatisfaction. Avoidance of exercise was in turn associated with less frequent moderate and strenuous exercise. There was not a direct association between weight stigma and self-reported exercise behaviors, which may be attributed to the low levels of obesity among sample participants. Additional research is needed to test whether weight stigma impacts exercise behaviors at higher levels of obesity.

Cardiovascular health outcomes. Weight bias may impact other indices of physical

health. Although no research has yet tested this relationship in adults, limited work has documented links between perceptions of appearance-based stigma and cardiovascular health indices in adolescents (180). It may be that weight bias creates higher levels of general stress, which in turn increases cardiovascular reactivity and vulnerability to negative health outcomes—see discussion by Puhl and Latner (8). Indeed, research has documented increases in physiological stress and cardiovascular reactivity in response to racial discrimination (181,182), as well as increased vulnerability to abdominal obesity and glucose intolerance among Dominican women who internalize negative racial stigma (183). In recognition of evidence demonstrating that stigma-induced stress may mediate the relationship between obesity and health, some researchers have proposed that psychological stress induced by weight stigma, in particular, may be a specific etiologic agent in the pathophysiology of obesity (184). This hypothesis needs to be tested, and there is much to learn about the relationship between the potential stress induced by weight bias and its effects on physical health outcomes.

Summary and methodological limitations

Evidently, more work is needed to determine the ways in which weight stigma is related to eating behaviors and physical activity. Although many questions remain in this new area of research, the existing evidence is sufficient to challenge common perceptions that stigma may motivate healthy eating behaviors, and instead suggests that bias may increase maladaptive eating behaviors, exercise avoidance, and in some cases reduce motivation to lose weight. Studies that assess the impact of stigmatization experiences on weight loss treatment outcomes are clearly a priority.

It will also be useful for future research to identify the degree to which weight bias increases vulnerability to psychological and physiological stress, and how this stress in turn relates to indices of cardiovascular health. There may be

important knowledge to be gained from existing studies on racial stigma and its impact on health, and whether parallels can be identified for health outcomes of individuals who experience weight bias.

STIGMA-REDUCTION RESEARCH

The importance of identifying effective methods to improve attitudes and reduce bias cannot be understated. Yet, the number of studies testing bias-reduction strategies pales in comparison to the amassing literature documenting weight stigma in multiple settings. Only a handful of experimental studies targeting bias-reduction have been published, yielding mixed findings (refer to (8) for review of bias-reduction studies targeting youth).

Several experimental studies have attempted to improve attitudes among adults by addressing attributions about the causality of obesity. One study provided participants with written information that emphasized biological, genetic, and noncontrollable causes of obesity, which significantly improved participants' attitudes compared to a control group. In addition, when participants were provided with information emphasizing internal, controllable causes of obesity, negative attitudes worsened further (124). These findings parallel previous work documenting improved attitudes following an intervention that highlighted external, noncontrollable reasons for obesity (123). However, other experimental research has found this method to have little impact on improving negative attitudes in adults (7). Given that many weight-based stereotypes (e.g., laziness, lack of willpower) stem from perceptions that the causes of obesity are within personal control, more empirical work is needed to test whether, and in what circumstances, strategies targeting causal attributions can effectively reduce bias.

Experimental research has also attempted to reduce weight bias by evoking empathy toward obese individuals. In one study, participants ($N = 153$) read first-person narratives of obese individuals who had experienced weight discrimination (7). This did not improve attitudes compared with control

conditions (e.g., reading a story of discrimination toward an individual in a wheelchair, or a control condition with a neutral story about a nonstigmatized person), but did reduce implicit bias among overweight participants. A second study tested a media-based empathy intervention where participants ($N = 108$) viewed either an empathy-evoking video of obese persons or a nonweight related control video, followed by additional videos of obese persons who were presented positively (e.g., as competent) or negatively (e.g., as clumsy) (185). The videos evoking empathy were ineffective in improving implicit and explicit antifat attitudes. Given that empathy induction has been demonstrated to be an effective strategy for promoting positive attitudes toward other stigmatized groups (186), it may be that certain forms of bias, such as obesity, are resistant to these strategies.

The fact that weight bias persists in the face of bias-reduction interventions highlights the complexity of this problem. Multiple strategies may be required to combat negative attitudes and reduce weight bias. In a recent study, kinseiology undergraduates ($N = 95$) completed a 6-week bias-reduction intervention consisting of didactic lectures, group discussion activities, and hands-on learning projects, where topics related to weight bias were embedded in a course related to fitness and sport testing (187). Lecture content included multiple components such as raising awareness of weight bias, invoking empathy, redefining professional practice and weight loss ideals with approaches that emphasize healthy lifestyles, and challenging perspectives that blame obese individuals for their weight. Overall, there was a significant positive change in students' antifat attitudes regarding whether people are responsible for their weight, which reduced stereotypes of blame toward obese persons. The authors suggest that these findings may have resulted from aspects of the intervention that emphasized multiple barriers that obese people confront in making healthy lifestyle changes. However, other stereotypes (e.g., perceptions that obese persons are lazy) did not improve following the intervention. In addition, the lack of control

group prevents determination of which aspects of the intervention were most or least effective, as different components were not compared or tested separately. These findings parallel previous research that reduced negative weight-based stereotypes among medical students ($N = 75$) through an educational intervention with multiple techniques including empathy induction, education about the noncontrollable causes of obesity, and role-play exercises (188). Again, because no control group was used for comparison, it is unclear which aspects of the intervention contributed to attitude change.

Educational interventions delivered through the Internet may be another strategy for improving attitudes. Hague and White tested an educational intervention delivered through an online course, which covered topics including the causes of obesity, consequences of weight stigma, social pressures to be thin, strategies to reduce weight bias in school settings, and ways to help students cope with stigma (189). Participants (258 student teachers and school teachers) who enrolled in the online course were randomly assigned to either a control group or one of four intervention conditions that manipulated the perceived credibility and body size of the course presenter who provided the online lectures. Participants' attitudes improved in all intervention groups, and exposure to a credible overweight presenter improved attitudes more than a credible nonoverweight presenter. These results are encouraging and suggest that Internet-based interventions may have potential to reduce weight bias. However, it is not known which specific topic areas of the course most strongly influenced attitude changes, and more work is needed to clarify the most effective intervention components.

Finally, some experimental research has tested a "social consensus" approach to reduce weight bias. This model proposes that stereotypes and stigma are a function of one's perceptions of others' stereotypical beliefs (190). In three experimental studies, university students completed self-report measures of attitudes toward obese people prior

to and following manipulated feedback depicting the attitudes of other students (124). In a first experiment, participants ($N = 60$) who received favorable consensus feedback (suggesting that others held more favorable beliefs about obese people than they did) reported fewer negative attitudes and more positive attitudes toward obese persons, and attributed obesity less to personal control compared to their reported attitudes prior to feedback. In a second experiment ($N = 55$), participants who received favorable consensus feedback were more likely to improve their attitudes about obese people if this feedback came from an in-group source with whom participants identified (e.g., students who belonged to their university) vs. an out-group source (e.g., students from a different college). In a third experiment, the social consensus approach remained predictive of positive attitude change for participants ($N = 200$) when this method was compared to other stigma-reduction interventions (such as providing causal information about obesity). These experiments indicate that learning about the positive attitudes of others can be effective in improving attitudes toward obese people.

More recent experimental research with university students ($N = 270$) has extended these findings, demonstrating that when one person condemns or condones discrimination toward a stigmatized group (including obese individuals), others will follow suit (191). This study found that simply overhearing an unknown peer briefly express views about discrimination produced attitude change in peers that remained at 1-month follow-up. Thus, even when attitudes are communicated in a single, brief social encounter by an unknown person, there can be a lasting impact in people's views over time. Social influence and social norms appear especially important in efforts to reduce discriminatory attitudes toward obese persons, and additional research in this area is warranted.

Summary and methodological limitations

In summary, these studies suggest several possible avenues for stigma-

reduction strategies, but raise many questions about how to successfully overcome negative attitudes toward obese people. With so little research on this topic, the most effective methods of reducing weight bias cannot yet be identified. More work is clearly needed to examine key factors that are necessary for effective stigma reduction, and to determine whether there are particular approaches, or combination of strategies, that may work better than others in certain circumstances or populations. Most of the work thus far has tested interventions among white college samples, with little or no attention to the effect of interventions on sustainability of attitude modification over time, how interventions impact actual behavioral changes, or comparison of existing bias-reduction methods. These are all important avenues for future research.

THE STATUS OF LEGISLATION TO PROHIBIT WEIGHT DISCRIMINATION

Unfortunately, considerable legal challenges remain for individuals who have experienced weight discrimination. In the past decade, no new state or federal laws have been passed on this issue. The District of Columbia, and the California cities of San Francisco and Santa Cruz include body size in human rights ordinances (192), but Michigan remains the only state that prohibits employment discrimination on the basis of weight (193). Thus, although lawsuits alleging weight-based discrimination appear to be increasing (194) overweight and obese individuals are primarily alone, and face significant obstacles, in their efforts to seek redress in court for wrongful discrimination.

Due to the lack of legislation expressly prohibiting weight discrimination, individuals must bring suit under existing laws prohibiting discrimination on other characteristics. The most common statute for these purposes has been the Americans with Disabilities Act, which continues to provide general nondiscrimination protection for persons with disabilities (193). However, for obese individuals to qualify under this statute their obesity must meet the definition

of a disability and be established from a physiological cause, making it difficult for most people to successfully bring discrimination claims (195,196). Thus, with the exception of a few individuals who have filed claims and whose body weight qualified them as "disabled" under the Americans with Disabilities Act definitions (197), employers continue to have legal freedom to discriminate against job applicants or employees on the basis of weight (198).

One alternative approach for protection under the Americans with Disabilities Act involves proof that the plaintiff's obesity is *perceived* by others (e.g., employers) to be disabling, even if no actual impairment exists, and that the individual was subject to weight discrimination on the basis of such perceptions (199,200). Although relatively few cases have been filed using this approach (200), and only "morbid obesity" is potentially protected as a "perceived disability" status (14), there has been an increase in the number of perceived disability discrimination claims in recent years (199) with obese plaintiffs achieving more success than cases where obesity-related actual disability claims are filed (199). There is some concern that the Americans with Disabilities Act could create additional stigma and backlash by suggesting that obesity is a disabling condition (193). Overall, disability laws fail to adequately address weight discrimination, and protection for obese individuals remains very limited (14,201,202).

Meaningful legal remedies are clearly needed to protect against weight discrimination, both at a state and federal level. The accumulation of science documenting weight prejudice over the past several decades provides ample justification for legal action. Unfortunately, legislation is lagging far behind the science. In 2007, Massachusetts introduced legislation (House Bill 1844) to prohibit weight-based discrimination in employment settings. Although virtually all testimony at the hearing was in favor of the bill, it did not pass out of the Labor and Workforce Development committee, and will be re-filed in the next legislative session. Clear efforts are needed to

Table 2 New and ongoing research needs in weight bias research

Domain	Research needs
General methodology	Evaluate the reliability and validity of measures assessing weight bias Increase longitudinal prospective studies to examine weight bias over time Assess behavioral expressions of weight bias and discrimination
Employment	Assess discriminatory practices in promotions, benefits, insurance, and wages for obese employees Assess generalizability of experimental studies to real-life hiring practices of overweight/obese employees Examine how characteristics of obese applicants (e.g., race, gender, age, job type) affect employment decisions Survey obese employees about perceptions of discrimination experienced in the workplace Identify and test strategies to reduce weight bias in employment settings
Health care	Assess provider attitudes and behaviors toward obese patients using experimental research designs Examine how provider attitudes impact clinical practice and quality of health care for obese patients Survey obese patients about stigma experienced in health care and its impact on health-care utilization Identify whether/how the medical office setting (e.g., size of equipment) affects health care for obese patients Identify and test strategies to improve provider attitudes and provider-patient communication with obese patients Determine whether experiences of weight stigma lead individuals to seek weight-loss surgery
Education	Document nature and extent of weight bias among educators and school staff Survey obese individuals about stigmatizing experiences in educational settings Examine the impact of weight bias from educators/classmates on academic outcomes of obese students Identify and test strategies to improve the school climate for obese students
Interpersonal relationships	Document the nature and extent of weight bias in familial, romantic, and peer relationships Clarify differences in social support and social networks between obese and nonobese persons Examine the impact of weight bias from interpersonal sources on emotional and physical well-being
Media	Examine weight bias in new media forms (e.g., video games, Internet, advertising, and reality television) Assess the impact of weight bias in the media on public attitudes/behaviors toward obese persons Examine how weight bias in the media affects well-being of obese children and adults Identify the nature/extent of weight bias in public health and/or weight loss social marketing campaigns
Psychological consequences	Assess longitudinally whether/how weight stigma contributes to psychological symptoms Examine the effects of childhood weight-based teasing over time Examine how various coping strategies alleviate or increase the negative consequences of weight stigma Identify links between weight bias and psychological outcomes for different ages, sexes, and ethnicities Assess the impact of internalized stigma/stereotypes on psychological well-being
Physical health consequences	Examine longitudinally whether/how weight stigma contributes to physical health outcomes Identify whether/how weight bias increases vulnerability to physiological stress and cardiovascular health Identify links between weight bias and physical health across age, sex, ethnicity Clarify links between experiences of weight bias and unhealthy eating behaviors/exercise avoidance
Stigma reduction	Develop, test, and compare effectiveness of stigma-reduction strategies to reduce weight bias in multiple settings Evaluate sustained attitude and behavior changes over time following stigma-reduction interventions Identify stigma-reduction strategies that lead to positive behavioral changes
Legislation	Assess public awareness and utilization of existing local/state laws to prohibit weight discrimination Assess public attitudes and barriers toward legislation to prohibit weight discrimination
Understudied topics	Document the nature and extent of weight bias in public accommodations, housing, adoption, jury selection, modes of transportation, health insurance coverage, restaurants, health clubs, and others.

disseminate the science on weight bias to help mobilize legislation to ensure that obese persons receive the equitable treatment they deserve.

DISCUSSION

The aim of this systematic review was to provide an update of the existing evidence concerning weight bias and

stigmatization toward overweight and obese adults in important domains of living. Since the previous review on this topic in 2001, the growing literature

indicates that weight bias remains persistent in settings of employment, health care, and education. Expanding beyond these domains, recent studies also demonstrate the presence of weight bias in the media and in close interpersonal relationships with family members and romantic partners, and indicate that bias and stigma pose threats to emotional and physical health of obese individuals. **Table 1** summarizes key findings of existing studies and categorizes these findings based on the amount of evidence to date.

These sobering findings paint an unfortunate picture for individuals struggling with excess weight who are surrounded with significant societal stigma and its consequences. With no systematic support and little public attention to the issue of weight bias, obese individuals are primarily left on their own to confront and cope with ongoing injustice. As researchers and health-care providers in the obesity field working to improve the lives of obese individuals, we cannot ignore the importance of addressing weight bias in these efforts, which must be considered alongside goals for effective prevention and treatment of obesity.

Important advancements in research have occurred since the 2001 review of literature on weight bias. More studies have surveyed obese individuals about their personal experiences of stigma, providing clearer evidence that obese persons perceive stigma and stereotypes in multiple settings. Increasing experimental studies have assessed weight bias in employment and health care, helping to establish unfair treatment of obese persons solely on the basis of their body weight. Emerging population-based studies using large representative samples have begun to document the prevalence of weight bias and discrimination, and demonstrate discriminatory practices in areas such as lower wages and hiring practices for obese employees, as well as disparities in educational attainment of obese individuals. There has also been an increase in studies published outside the United States documenting weight bias in various settings (e.g., health care), showing that obese persons

are vulnerable to stigma in other countries and cultures.

Of critical importance is research assessing the impact of weight bias on psychological and physical health, an area that has received little attention until recently. The emerging research thus far suggests that weight bias increases vulnerability to depression, low self-esteem, poor body image, maladaptive eating behaviors, and exercise avoidance. These negative consequences challenge societal notions that stigma may serve a positive function of motivating healthy eating behaviors, and instead suggest that bias may impair efforts to engage in healthy lifestyle behaviors through negative emotional distress and unhealthy eating patterns.

Despite the accumulation of science in recent years, important gaps in research remain.

It will be particularly important for future research to examine the effects of weight bias and discrimination on other indices of physical health, such as cardiovascular health and physiological stress. Longitudinal studies are needed to examine the impact of weight bias over time, and to identify how various coping strategies alleviate or increase the negative consequences of weight stigma. More work is needed to examine the nature and extent of weight bias in interpersonal relationships, and how internalization of stigma influences psychological and physical well-being. **Table 2** outlines these and other new research questions that are needed to make meaningful contributions to this area of study, and to move the field forward.

Perhaps needed most are studies to develop, test, and compare effectiveness of stigma-reduction strategies to reduce weight bias in multiple settings. The number of studies testing strategies to reduce weight bias is few, and pales significantly by comparison to the amount of research now documenting weight bias from many sources. Of the few studies that exist, weight bias appears to be a challenging stigma to reverse, and may be resistant to interventions that have successfully improved attitudes toward other stigmatized groups. It is likely that multiple stigma-reduction strategies

will be needed to shift negative societal attitudes about obese persons. This may require education about the complex causes of obesity and the harmful consequences of stigma, recognition of the difficulties of obtaining significant and sustainable weight loss, efforts to challenge weight-based stereotypes, promotion of weight tolerance in multiple settings where bias is present, and legislation to prohibit inequities based on body weight.

Unfortunately, it does not appear that the increasing prevalence of obesity has attenuated negative societal attitudes toward obese people. In contrast, the growing science on this topic demonstrates that weight bias persists and has expanded to other domains of living previously unstudied, and may actually be increasing in prevalence. Important research questions continue to remain untested, and organized scientific efforts are needed to fill important gaps of knowledge. Without sufficient attention to this issue in the obesity field and in larger society, it is likely that weight bias will remain both a social injustice and a public health issue, impairing the quality of life for both present and future generations of obese individuals.

ACKNOWLEDGMENT

This research was funded by the Rudd Center for Food Policy and Obesity at Yale University.

DISCLOSURE

The authors declared no conflict of interest.

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